RQA TTW Strategies

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RQA and TTW Strategies: Which Can Increase the Students' Concepts Understanding?

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Abstract: Concepts understanding is the key for students to have quality knowledge. A good concepts understanding will affect the achievement of other abilities such as the ability to think critically and creatively. This study aims to see the application of two strategies, namely RQA (Reading-Questioning-Answering) and TTW (Think-Talk-Write) in improving students' concepts understanding. The research method used is posttest only control group design with a total sample of 60 students divided into two experimental classes. The treatment for the first experimental class was the RQA strategy while the treatment for the second experimental class was the TTW strategy. After the treatments, the students were given 20 questions about concepts understanding motion and force material. Based on the results of testing and data analysis, it is found that there are differences in the achievement of students' conceptual understanding between RQA strategy and TTW strategy. Based on the results of the study, it can be concluded that the three steps in the TTW strategy have a better impact on the seven aspects of conceptual understanding compared to the RQA strategy. This study provides recommendation for teachers to correctly choose learning strategies according to the character of the material to be taught.

INTRODUCTION

21st-century skills known as 4C (Critical Thinking, Creativity, Collaboration, and Communication) are a topic discussed in the world of education. Educational institutions are challenged to develop learning concepts that focus on developing these abilities. This is because learning so far is still considered far from what is needed by the industrial world (Boholano, 2017; Ongardwanich, Kanjanawasee, & Tuipae, 2015).

The key to the achievement of 21st-century skills lies in the quality of concepts understanding possessed by students. In other words, it can be said that the higher the quality of students' understanding, the greater the likelihood that they can master high-level thinking skills such as critical and creative thinking. Therefore, learning that emphasizes conceptual understanding aspects becomes as important as learning that emphasizes high-level thinking skills (Anggareni, Ristiati, & Widiyanti, 2013; Jatmiko et al., 2018; Panggabean, 2013).

The ability to understand concepts is an important achievement for students in learning science, especially physics. The material of physics is characterized by the abundance of theories, laws, and concepts which require the students to

understand well (Ferywidyastuti, 2019; Maulida, Yusrizal, & Melvin, 2017; Syukri, Mursal, & Sakdiah, 2018; Wardhany & Amirullah, 2017). The students are expected to be able to receive and retell information with their understanding related to the context (Afwa & Latifah, 2016; Pebriana & Diantoro, 2018). Learning based on understanding will produce new knowledge and solve cases in different forms (Masitoh & Prabawanto, 2015; Trihono, 2015; Widiadnyana, Sadia, & Suastra, 2014).

However, based on the results of the preliminary study at a junior high school in the city of Bandar Lampung, it was found that the average score of students' concepts understanding was still low. This finding was then followed up with interviews and observations of learning there. Based on the results of observations and interviews, it was found the fact that teachers were still having difficulty in developing the right learning strategies. The quality of concepts understanding achieved by students is very dependent on the teacher's ability to manage to learn. The accuracy of teachers in choosing learning models and strategies has a positive impact on students' understanding. Therefore, carefulness to choose models, strategies, and even learning media is necessary (Kangas, Koskinen, & Krokfors, 2016; Utami, Siahaan, & Purwanto, 2016).

The combination of models, strategies and the right media is expected to be able to overcome the low achievement of students' concepts understanding (Hardiana, Andari, & Krisdiana, 2015; Saregar et al., 2018). Some learning strategies that are considered capable of influencing the students' concepts understanding include Reading Questioning Answering (RQA), Think Talk Write (TTW), Think Pair Share (TPS), Team Games Tournament (TGT), and so on (Darmayanti, 2015; Faqih, 2019; Hardiana et al., 2015; Nurjanah & Poernomo, 2018). In this study, researchers tried to compare the RQA strategy with the TTW strategy to overcome the low concepts understanding of junior high school students. Several previous studies reveal that the TTW strategy can overcome the students' difficulties in problem-solving, learning outcomes, and mathematical writing skills (Nurjanah & Poernomo, 2018; Sopiany & Hijah, 2016; Suyanto, 2016). Meanwhile, the RQA strategy has also succeeded in overcoming students' low learning outcomes, mastery of learning, critical-thinking skills, and students' metacognition (Maulida et al., 2017; Nuzulah & Budijastuti, 2018; Sumampouw, 2011; Thalib, Corebima, & Ghofur, 2017).

Although there are many studies on the application of the RQA and TTW strategies, yet, there are no studies that compare the two strategies in overcoming each indicator of concepts understand. The results of this study are expected to guide for teachers to be able to choose the right learning strategy based on the characteristics of the material to be taught and the learning outcomes that they want to optimize.

THEORETICAL SUPPORT

Learning strategy is a planned activity that involves all aspects of learning to achieve predetermined goals. RQA strategy (Reading, Questioning, and Answering) is developed due to the difficulty of students when instructed to read the material (Bahri, 2016). The RQA strategy has three main steps, namely (1) Reading, (2) Questioning, and (3) Answering (Rahmawati, 2014; Thalib et al., 2017). The RQA strategy is developed based on a constructivism approach (Darussyamsu & Fadilah, 2017). The three steps can force students to read subject matter (Nuzulah & Budijastuti, 2018) and are expected to increase students' interest in reading and learning

so that it can influence the aspects of concepts understanding (Abdullah, 2014).

The TTW strategy (Think-Talk-Write) was first introduced in 1996 by Huinker and Laughlinn (Suyanto, 2016). The TTW strategy, according to its name, has three steps or activities, namely (1) Think, (2) Talk, and (3) Write (Afthina & Pramudya, 2017). The TTW strategy is born from a cooperative learning model that focuses on student-centered learning (Angriani, Bernard, Nur, & Nurjawahirah, 2016; Gull & Shehzad, 2015). Students are allowed to learn to solve problems by understanding them first and re-processing them into information using their own words and understanding (Sopiany & Hijah, 2016). The TTW strategy is proven to be able to train students' social, oral, and language skills (Ramadhani & Motlan, 2015).

Concepts understanding in cognitive aspects is categorized in the realm of C2, namely the dimension of knowledge understanding (Krathwohl, 2001). In this study, researchers used aspects of concepts understanding that had been developed by Anderson and Krathwohl which were divided into seven indicators of understanding namely, (1) interpreting, (2) exemplifying, (3) classifying, (4) summarizing, (5) drawing inference, (6) comparing, and (7) explaining (L. W Anderson & Krathwohl, 2010; Irwandani & Rofiah, 2015; Radiko, Kurniawan, & Muliyani, 2018). In general, the interrelationship between RQA and TTW strategies towards concept understanding indicators from this study can be seen in Table 1.

Table 1. The Relationship between RQA, TTW, and Concept Understanding Indicators to be Achieved

Concepts Understanding of RQA	Concepts Understanding of TTW
Reading (Interpreting, Exemplifying, Classifying)	**Think** (Interpreting, Classifying, Exemplifying)
Questioning (Summarizing, Drawing Inferences)	**Talk** (Comparing, Explaining)
Answering (Comparing, Explaining)	**Write** (Summarizing, Drawing Inference)

METHOD

This study uses quasi-experimental with posttest only control group design. The population of this study was all eighth-grade in one state junior high school in Bandar Lampung city. The samples were taken using random sampling techniques where samples were chosen randomly without particular consideration (Trianto, 2011). In this study, the samples of 60 students were divided into two experimental classes.

Table 2. Posttest Only Control Group Design

Class	Treatment	Posttest
Experimental 1	X_1	O_1
Experimental 2	X_2	O_2

Data collection techniques in this study were test instruments and were given during posttest. The instruments were made based on seven aspects of conceptual understanding with motion and force material for junior high school students. Furthermore, the score of concept understanding tests was processed to look for the average scores of the experimental class 1 and 2 then presented in a comparison between the two. Data analysis was performed to see each aspect of concepts understanding in each treatment. To see the effect of treatment, hypothesis testing was carried out by using the t-test after the prerequisite tests were carried out, namely the normality and homogeneity tests.

RESULT AND DISCUSSION

After the implementation of two learning strategies and concept understanding tests, the data were obtained through posttest in each experimental class. Table 3 presents the score of posttest on concepts understanding of the classes that apply the RQA (Reading, Questioning, and Answering) and the TTW (Think-Talk-Write) strategies.

Table 3. The Score of Concept Understanding Based on Strategies Implementation

Strategy	Number of Data	Lowest Score	Highest Score	Average Score
RQA	30	25	80	54.2
TTW	30	40	100	74.2

Based on Table 3, it can be seen that the results of concept understanding tests in the class that applied the RQA strategy got the highest score of 80 and the lowest score of 25 with an average overall score of 54.2. Meanwhile, the score of concepts understanding in the class that applied the TTW strategy got the highest score of 100 and the lowest score of 40, with an average score of 74.2.

Next, to see the achievement of each indicator of concepts understanding in each experimental class is presented in Figure 1 below.

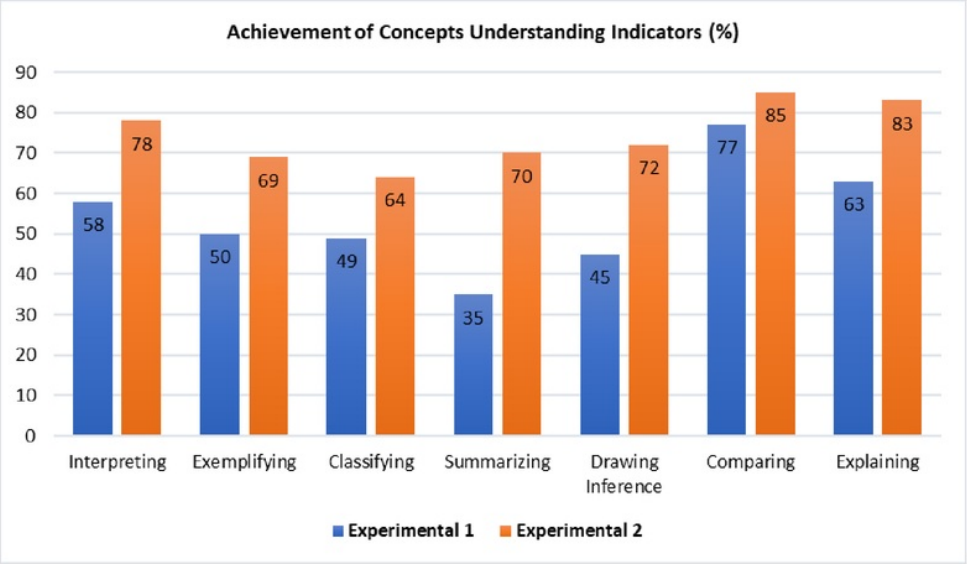

Figure 1. Achievement of Concepts Understanding Indicators for Experimental Class 1 and 2

The data shown in the graph for RQA strategies is superior in the aspect of comparing with a percentage of 77% and low in the aspect of summarizing with a percentage of 35%. TTW strategy is superior in the aspect of comparing with a percentage of 85% and low in the aspect of classifying with a percentage of 64%.

To see the influence of the RQA and TTW learning strategies on concept understanding, the hypotheses were tested. The following are the prerequisite test results from the two experimental classes.

Table 4. Normality Test Result

Class	N	$L_{critical}$	L_{table}	Result
Experimental 1	30	0.0629	0.1617	Normal
Experimental 2	30	0.1230	0.1617	Normal

Table 5. Homogeneity Test Result

Class	$L_{critical}$	L_{table}	Result
Experimental 1 Experimental 2	0.683	1.840	Homogeneous

Based on Table 4 and 5, the data were normally distributed and have homogeneous variations so that further hypothesis testing can be carried out using the t-test. The following is the result of the calculation of hypothesis testing using the t-test with a significance level of 0.05.

Table 6. Hypothesis Test Results

$t_{critical}$	t_{table}	Result
2.2937	2.0422	H_0 is Rejected

Based on Table 6, the value of $t_{critical}$ is greater than t_{table} with a significance level of 0.05, so, the H_0 is rejected. It means that there is a significant comparison between TTW and RQA learning strategies toward the concepts understanding on the motion and force material. Furthermore, which learning strategy is better in the concepts understanding on the motion and force material? Based on the analysis in Table 3 and Figure 1, the answer is that the TTW (Think-Talk-Write) strategy is better on the concepts understanding on the motion and force material compared to RQA (Reading, Questioning, and Answering). To discuss why TTW strategy is better than RQA in concepts understanding, the following are the results of the comparison between each step of the strategies.

Table 7. Percentage of Achievement of Understanding of Concepts in Steps of RQA and TTW

Strategy	Steps of Strategy	Aspects of Concepts Understanding	Average (%)	Total Average (%)
RQA	1. Reading	Interpreting Exemplifying Classification	52 %	54 %
	2. Questioning	Summarizing Drawing inference	56 %	
	3. Answering	Comparing Explaining	54 %	
TTW	1. Think	Interpreting Exemplifying Classifying	70 %	75 %
	2. Talk	Comparing Explaining	84 %	
	3. Write	Summarizing Drawing inference	71 %	

The data shown in Table 7 is the comparison of indicators of concepts understanding that occur at each step of RQA and TTW strategies. In the "Think" step, the interpreting, exemplifying, and classifying indicators run optimally with a percentage of 70 % compared to the "Reading" step of the RQA strategy which obtained a percentage of 52 %. The summarizing and drawing inference indicators in the "Write" step of the TTW strategy run optimally with a percentage of 71 % compared to the "Questioning" in RQA strategy which only obtained 56%. The comparing and explaining indicators obtained the highest percentage in the "Talk" step with a percentage of 84% compared to the RQA strategy at the "Answering" step of 54%. Overall, the achievement of the average concepts understanding of the TTW strategy is better than RQA in the of motion and force materials.

To see how the TTW strategy is better in concepts understanding than RQA, we can see the TTW process in improving each indicator of concepts understanding. In the TTW strategy, the

students are conditioned to think first through the "Think" step. In the process of thinking, the students learn to reinforce their concepts understanding abilities such as interpreting, exemplifying, and classifying the physics concepts they get.

After going through the thinking process, the students are then invited to speak through the "Talk" step. In this step, the students are allowed to speak and express ideas as a result of their thinking processes. Through the "Talk" step, the students train themselves to improve their concepts understanding, such as comparing and explaining.

After the students understand to explain the concepts, they then write the concept through the "Write" step. Through this step, the students learn to summarize and draw conclusions of the discussions that have been conducted. The step of rewriting can strengthen students' concepts understanding. This finding is reinforced by several research results that say that the TTW strategy can improve students' concepts understanding (Fitriyana & Asnurida, 2018; Kurniawati, Sutopo, & Chrisnawati, 2018).

This is a strong reason for the TTW strategy to be able to accommodate concepts understanding compared to RQA. In the "Reading" step in the RQA strategy, students are required to read concepts and interpret according to their understanding. If we analyze more deeply, the literacy understanding ability of each student must be different (Pahrudin, Irwandani, Triyana, Oktarisa, & Anwar, 2019). This step can be expected to be one of the weaknesses of the RQA strategy in providing conceptual understanding to students.

After reading, students are then asked to make questions. At this step, the researchers also suspect that this step is a weakness of the RQA strategy to provide concepts understanding to students. This is because not all students can make qualified questions. Good questions generally arise if they have understood the concept as a whole. Furthermore, strengthening the concept of the RQA strategy is located at the "Answering" step. At this step, students are asked to answer the questions asked. The answers given by students come from what they read.

One of the strengths of the TTW strategy that is not found in the RQA strategy is the "Write" step. Writing activity is one of the stimuli for students to strengthen their memory. Through the "Write" step, the students' memory becomes stronger. Strong memory makes it easier for students to understand the material that has been taught to them.

Furthermore, in the TTW strategy, the learning process is dominated by interactions that occur between students to solve learning problems together (Supraptinah, Budiyono, & Subanti, 2015). The TTW strategy itself is a cooperative learning strategy wherein each step, all students are encouraged to participate actively in the learning process (Ul & Surya, 2017). Each step in the TTW strategy makes students able to share knowledge with their group mates so that the conceptual understanding of each student tends to be more even (Faqih, 2019).

Meanwhile, the RQA strategy derived from the concept of constructivism learning (Darussyamsu & Fadilah, 2017), requires students to be able to construct their knowledge. When students are not maximized in constructing their knowledge, in the next step, the students are only able to make basic questions and answer basic questions as well. Therefore, efforts are needed to optimize the RQA steps to be able to improve the quality of the ability to ask and answer (Winarno, Tindangen, & Palenewen, 2018).

CONCLUSION

Based on the results of the study, it can be concluded that the TTW strategy has a better impact on seven aspects of

students' concepts understanding compared to the RQA strategy. The TTW steps that focus on thinking, speaking, and writing activities are proven to be able to optimize the ability to understand concepts in all indicators compared to the RQA strategy. The use of TTW strategy in this study is more effective and efficient to use in motion and force materials. The results of this research provide recommendations to the teacher to use the TTW strategy on motion and force materials and other materials that have the same characteristics as motion and force material.

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